

Highlights

California Energy Commission Workshop on Exploring Alternative Wholesale Electricity Market Structures for California

November 7, 2001 (9:00 am – 4:15 pm)
California Energy Commission Hearing Room A
Sacramento, California

Disclaimer: The speakers at this workshop were asked to engage in open discussions during this workshop and to contribute positively to the public interests of California. Their views did not necessarily represent the views of their affiliated organizations.

The purpose of this summary report is to supplement the written materials presented at the workshop and the official transcript, by describing the significant and relevant points of each presenter and to highlight valuable comments that were brought out from the floor.

Propensity of a Competitive Power Market towards Boom/Bust Cycles – Theory and Insights

Andrew Ford

Ford described the historical boom/bust cycles in real estate as parallel to the electricity market. Developers waited to see real estate price increases before starting to build. A 15% reserve margin built by the CPA would not induce new investment.

A fixed capacity payment, if set appropriately, would break the boom bust cycle. He suggested that capacity payments with a fixed rate of about \$20 per kW-year might damp out the boom bust cycle and increase the incentive for generators to provide a higher reserve margin.

CPA investment is currently limited to \$5 billion. Investment of this money in peakers and wind units will stave off the impending price spikes for 2002-2004 time frame, but will have the undesired outcome of driving out private investment. Eventually, this will lead to price spikes.

The study showed that real time pricing was the most effective weapon in solving the power crisis. Investment in production facilities must occur either through capacity payments or a well-funded CPA for the long term. Bilateral contracts are helpful, but reliance only on bilateral contracts is not the solution. We need to implement a capacity payment, but we need to explore more thoroughly how this might be set.

California is on the crest of a boom in capacity additions and on the threshold of a bust.

Comment by Art Rosenfeld

We need demand payments as well as capacity payments. The demand side has been neglected.

Comparison of a Competitive Wholesale Power Market with Alternative Structures through a Long Term Power Market Simulation

Stephen Lee

One purpose of restructuring is to drive down electricity prices. The advantage of a competitive market is to incent improvement and innovation. However, its focus on maximizing profits leads to a boom and bust market. Also, a competitive market does not consider all public benefits. In the 70s and 80s, oil prices tripled and electricity prices doubled. In the past two years, if costs had been passed through to the users, prices would have tripled.

The computer model looked at California month by month over 20 years. Many sensitivity studies were done. The study looked at effects of bilateral contracts, demand response, and a hybrid market involving a power authority.

Two groups of builders are used in the model. One group considers cost benefits and also builds enough to maintain a satisfactory reserve margin, e.g. 12%. The other group focuses on cost benefits ratio only. In the hybrid market scenario, the power authority builds on a “contrarian principle,” i.e., only when the private investors consider it uneconomical, thus supplementing the market. Market power is a function of reserve margin. Low reserve margins mean higher market clearing prices. The model does not simulate real time pricing. This model differs from Ford's model as to assumptions, but predicts similar boom and bust cycles. Higher degrees of competitiveness aggravate the boom and bust cycles and cause greater price volatility. More bilateral contract activity dampens price volatility. With the power authority building peak capacity, initially there is a reduction in price increases, but later prices tend to increase again. There seems to be a narrow range of participation by the power authority in supplying peaking capacity, beyond which the private investors may permanently defer future capacity investments.

We want a healthy and robust market and we have learned what not to do. Whatever we design should be tested with models first, before real life implementation; and whatever design develops, we need a portfolio of different supply and demand side options.

Comment by Richard McCann

The demand side has not been adequately explored, and the demand reduction we saw this year was not a response to prices – it occurred before the price increase in June and the demand programs of the summer. The 40% rate hike will get a demand response. Past analysis for CPUC showed demand had elasticity of 0.5.

If we pay demand what it is worth, we would see a real value of load reduction of 6:1.

Comment by Art Rosenfeld

We need long term demand response, similar to auto-fuel efficiency that grew out of the oil crisis. Every new building needs to have a real time meter. The CEC did research letting building temperatures float up 4 degrees higher than previously set (78 degrees) and saw 30% reduction in A/C load. All of these models need to account for this phenomenon.

Panel Discussion on Long Term Objectives of the California Wholesale Power Market – Karen Griffin, Moderator

Eric Woychik

We need market pricing with locational focus and at a minimum, price responsive demand. Socialization of transmission congestion is a mistake. We should automate plant based bid caps and make the market reflect the physical grid. There must be consumer response, and California needs to get with the program and quit the grandstanding. This state must work with the WSCC and get a regional solution.

Lawrence Lingbloom

The legislature knows that customers don't care about FERC, wholesale markets, and competition; they just want the lights on at a reasonable price. The public, and therefore the legislature, is very risk averse at this point and he sees a purely competitive market as "inconsistent with state policy objectives."

Maybe the eastern markets work because there are fewer moving parts? California market participants have abused each other and he doesn't know how to solve the problem.

Kellan Fluckiger

His key point was the last one - we need the institutional will to make immediate change.

Market power concerns aside, there are legitimate differences to the view of a power plant in the market today. Power plants are now seen as assets used to produce a return on investment, not as vital parts of a system designed to deliver reliable power 24 hours per day.

The grid is a problem too. It was designed to send power to specific places under control of individual utilities and it wasn't designed for the free market. Lifting the obligation to serve from utilities forced the CAISO to become the provider of last resort.

We need a cost of service capacity reserve market over the peak that isn't subject to high prices, a large bilateral market, full regional coordination, feasible schedules, and non-performance penalties. High volatility isn't a good business signal, contrary to others' comments. Power at any price is not the way to run a system.

Panel Discussion on the Means of Reducing Price Volatility in a Competitive Power Market from the Supply and the Demand Side - Michael Jaske, Moderator

Carl Blumstein

When near the limit of supply, small changes in demand make large changes in price, creating price volatility. We can change supply by having public power peaking plants or with price payments. Another thing that could be done to reduce the volatility is to lower the demand by conservation or real-time pricing. Real-time pricing also provides efficiency. One would not buy power when the price is high. It also gets the price signal right, which is very important. Another option is hedging mechanism in a mature market. Public investment may drive out private investment.

Steven Stoft

Steve pointed out two demand-side flaws in the current system:

1. Lack of real-time metering and billing
2. Lack of real-time control of power flow to specific customers

Because of these flaws, the market will not always clear and system operator has to set up a price limit. Furthermore, the price limit caps the entire market.

To ensure sufficient investment and system reliability, market regulators may utilize the following three factors to control the profit function of generators.

- A. Operation reserve requirements.
- B. The price system operator pays when short of reserves.
- C. Installed capacity requirements.

It appeared to offer a mechanism for designing a stable wholesale market during conditions of low operating reserves, replacing a fixed price cap and relieving the market from depending on the very high "value of loss of load" pricing. Having a profit function would spread the hours for recovering investment costs from typically 3 hours per year to about 100 hours a year, and avoid extreme price spikes.

Utilizing a capacity market may help the state to avoid boom-bust investment cycles. Without realizing the inter-relationship of the above three factors, regulators have unwittingly been designing price spikes in California.

Steve also indicated that some potential problems still exist in the installed-capacity market, such as competition over higher price spikes between different system operators. Therefore, the best outcome will only result from coordination and cooperation between FERC and NERC.

John Chandley

We cannot go back, so let us go forward with 8 steps that will have to happen: we are not doing what the Tariff says now, and we need to comply.

1. Poolco with automated dispatch
2. Security constrained dispatch
3. Keep the spot market open to everyone
4. Get DWR out of the control room of the CAISO
5. Get DWR out of the settlements process
6. Go to marginal cost pricing
7. Locational spot prices needed.
8. Real time pricing (RTP)

It is likely that California will have to become an RTO, or part of an RTO, like the Southeast RTO; eventually, the RTOs will become part of a national grid. Consumers are reluctant to deal with RTP, so target the customers who can and will deal with it. The real-time meters already installed in California are a good start.

Panel Discussion on the Alternative Wholesale Market Structures for California - Andy Ford, Moderator

Philippe Auclair

We haven't seen a competitive market yet. Any redesign must reflect the physical system with feasible schedules and have simple rules to get good signals for new generation. The market must be transparent. Market design must contain both spot prices and long term contracts. The market mechanism in California has been ad-hoc, not transparent and has only spot prices. Complex regulations applied to a complex system will not work. We need to simplify the market.

Lorenzo Kristoff

When the margin is less than 25%, you get price manipulation with the current system.

Externalities are significant:

1. the cap affects the whole economy
2. the retail end is the key- consumers and suppliers need to see actual cost of service
3. we need a commercial model that reflects the physical system

Market decisions are made irrespective of the impact to the CAISO, and these decisions greatly impact its ability to function.

Charles Kolstad

We need merger guidelines like the Sherman Antitrust Act.

State could sell power contracts. Ultimately, somebody has to provide term contracts and the state could do so instead of owning generation.

Wholesale market design depends on retail design. Capacity payment isn't necessary. We could have capacity reserve option contracts. The term of the contract could be 5 minutes to three hours; that is yet to be determined. We need a well-designed market that provides a foundation for a spot market, as all systems need some economic dispatch. A spot market is necessary, but isn't necessary to drive long term contracts.

Comment by Rich McCann

The market design must recognize that we have different kinds of customers who have different reliability needs and afford them the opportunity to pay for the level of reliability required.

We need better linkage between hour to hour bids, 10-minute markets and the commitment process.

A big question to be resolved is how to pass through the stranded costs of the summer power purchases. He recommends a fixed charge, not a volumetric charge. A volumetric charge would incent less desirable forms of conservation and distributed generation.

General Notes About the California Wholesale Power Market

There was a broad consensus in support of a healthy competitive generation market, and a hope that California could evolve into it through a well thought-out transition period, provided that a clear vision of the end-state was agreed upon by all stakeholders. However, many speakers stated that there was no "perfect" market design, so it was still not clear what that end-state for California should be. Particularly, there was no consensus on the need for competition at both the wholesale and the retail levels. Opinions were also expressed that it was not clear how California could go back from the current situation to a fully regulated system.

The notion of "boom and bust" cycles seemed generally accepted, although the details were not examined and the modeling techniques that quantified and explained history in such terms were not discussed or challenged by the participants.

There was consensus that California needed to change its current wholesale power market structure. The pricing structure must be changed so that wholesale market prices can be promptly passed through to the retail side causing demand to respond.

Having electricity prices respond quickly to short-term or real-time market fluctuations was felt to be essential to bringing about a functional market where supply and demand could meet, at least at the wholesale level. However, excessive price volatility was not considered needed to provide incentive for the generators to build sufficient generation. Several alternatives to reduce short-term price volatility were discussed, supported to some degree by the computer simulations of Ford and Lee.

Several speakers pointed to the fact that California was situated in the western region and that California could not ignore the regional market. For example, if California adopted a pricing structure that was incompatible with the profit incentive within the rest of the region, then out-of-market transactions would take place, as has recently happened in California.

One failure of the pre-summer 2000 restructured California market was the lack of an "Obligation to Serve" by the load serving entities or the utility distribution companies. Another weakness was the lack of an "Obligation to Perform" by the generators. One speaker proposed that the load serving entities should have a reserve requirement.

General Notes About Demand Side Programs

On the customer side, there was consensus that demand elasticity must be increased by raising price sensitivity. There were differences of opinion as to how and whether there should be a safe harbor for those consumers who preferred not to bother with changing their consumption patterns in response to price fluctuations.

Regarding the means of demand response, there was broad support by many panelists for real-time pricing. However, other demand side programs were also advocated. Examples were incentive programs for conservation, the use of public appeals for conservation, payments to incent consumers to reduce their peak demand, and the use of interruptible loads as additional real-time measures by the ISO to balance supply and demand. There was concern that during periods of boom, when real-time price variation was low, consumers would not be motivated to subscribe to real-time pricing. Real-time pricing alone, therefore, would not be sufficient.

On the issue of the safe harbor, there was no uniform agreement. Some speakers expressed the concern that bifurcating retail rate designs between large and small customers to permit "reasonable" rates for small customers could be interpreted as subsidies, which they rejected. However, other speakers suggested the principle that consumers who preferred stable prices should have the option to sign up for such programs with a hedging entity, e.g., the distribution company, provided that no cross-subsidy was used. This would mean that in return for the price stability, the reduction of

risk would be accompanied by a higher average price. This would not be a violation of market principles.

General Notes About the Role of the State

To meet some of the long-term public objectives, it was not disputed that there should not be a role for the State of California in the power market. However, the study results by Lee showed that investment in peaking capacities by the State would likely lead to a reduction in private investment in new power plants, through postponement until the reserve margin dropped low enough to increase profit incentive to a sufficient level to resume building. In other words, the State's peaking capacity could in the long term be merely substituting for private investments instead of supplementing them. However, there did not seem to be evidence that investment by the State in renewable generation and conservation would interfere with the private market.

Some speakers indicated that in California, there had been a corruption of the process and structure for the electricity market, for example, the independence of the ISO and the integrity of the settlement process involving the DWR.

Some speakers from the floor brought out the looming financial problem of the State, which paid the large amount of money to purchase power for the utilities and suggested that a plan would be needed to pay it off.

In conclusion, the workshop was well attended by over 100 people. Discussions were enthusiastic and participation from the floor was very active, including some excellent ideas and insights.